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RESEARCH

A "learning paradox" in maritime spatial planning

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Abstract

Both policy-makers and scholars acknowledge and emphasize the need for learning in maritime spatial planning (MSP). However, few explain why learning is important. As such, it remains a vague and understudied process and is taken for granted and assumed to be and do "only good" which might hinder an in-depth assessment of the effectiveness of learning in policy-making. In this paper, we investigate whether, and if so in what way, explicit attention is given to learning in MSP. In this way, we try to unpack a (plausible) "learning paradox" and gain more insight into the different conceptualizations of learning in MSP. We use seven dimensions to examine learning in MSP by conducting a literature review of scientific MSP literature and a case study, which analyzes learning in the Dutch MSP process. The literature review and case study point to a "learning paradox" in MSP, showing both similarities and differences. The common lack of attention for risk and ambiguities is particularly problematic, while the existing clarity about who (should) learn and how can be seen as opportunities to gain insights in learning in MSP. Overall, we argue that acknowledging the paradox is paramount to improve the effectiveness of learning processes in MSP.

Keywords Maritime spatial planning · Learning · Learning paradox · Adaptive management · Literature review · Dutch MSP

Introduction

Since the first international workshop on marine/maritime spatial planning (MSP) organized by IOC-UNESCO in 2006, we have witnessed the beginning of a new era in marine governance, highlighting spatiality and territoriality at sea (Abspoel et al. 2019; Jay 2010a). Back then, only a few countries were talking and thinking about MSP, while now, more than 10 years later, about 70 countries have developed MSP initiatives, ranging from early stages to plan revisions and adaptations (UNESCO n.d.; Jay et al. 2013). Many of these countries are European Union (EU) member states—encouraged and supported by the EU directive on MSP (2014/89/EU) which has entered into force in 2014 (European Union 2014). The MSP Directive lays down obligations for the EU member states to establish a "maritime spatial plan, or plans" (Art 9.) by 2021 (European Union 2014). The topic of MSP also gained enormous interest from the social science scholars, especially geographers and planners (Jay 2010a; Jay 2010b). MSP did, and still does, provide the scientific community a challenging research arena to investigate questions on legitimacy, participation, and policy effectiveness in the marine realm, and to explore interdisciplinary connections to better understand how a marine ecosystem–based approach can be put in practice.

Both in academia and in policy, adaptive management is considered a key component of MSP, most notably introduced and advocated by Douvere and Ehler in their work for international governmental bodies, such as the IOC-UNESCO and the EU (Ehler and Douvere 2007, 2009; Ehler 2018) and in their keystone publications (among others: Douvere 2008; Douvere and Ehler 2008, 2009, 2012; Ehler 2008; Ehler and Douvere 2007). Integrated and adaptive MSP is based on an iterative process, often described as "learning by doing", since information from previous experience feeds back into

Critical turn in Marine Spatial Planning - whence and whither?

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management to improve the way it is conducted in the future. As such, evaluation helps management to adapt through a "learning process" (Ehler and Douvere 2009). In this way, policy-makers learn from the previous MSP process and make improvements for a next round in the MSP process. Scholars also acknowledge the need for learning in MSP, as it is still a rather new approach, and emphasize that MSP is a dynamic process of continuous reinterpretation and decision-making (Ehler et al. 2019). MSP is thus about not only "learning by doing", but also "learning from others". Knowledge and information exchange is seen as an important element to support MSP processes, and various support mechanisms have been developed for this purpose (i.e. handbooks and toolkits, research projects co-funded by the European Union, MSP platforms and policy/research networks) (European Union n.d.).

While "learning" is generally recognized as an important ingredient of MSP processes, it also seems to remain a vague and understudied process and is taken for granted and assumed to be and do "only good". We do not doubt that learning take place in MSP, yet do question if learning is fulfilling its potential. Taking lessons from Bennett and Howlett (1992), we argue that there is a need to be explicit about what learning is and does in MSP. In their seminal paper on learning in public policy, Bennett and Howlett expressed concerns about the conceptual ambiguity of learning. They claim that three analytical questions ("who learns", "what is learned", and "to what effect") have to be addressed to let learning be effective for public policy (Bennett and Howlett 1992: p. 289). Armitage et al. (2008) took a similar position, coining the neglect of explicit attention to learning "a learning paradox" (Armitage et al. 2008). To them, it seems self-contradictory to be emphasizing the importance of learning while not putting effort in better understanding the learning process itself. Examining the "learning paradox" in the context of adaptive co-management, they considered five dimensions: "1) types and definitions of learning; 2) learning goals and expectations; 3) mechanisms by which learning takes place; 4) questions regarding who is involved in the process of learning and 5) the risks and ethical ambiguities faced by different actors expected to willingly participate in a learning process whether formal or informal" (Armitage et al. 2008).

In this study, we use the dimensions as defined by Armitage et al. (2008), and added two more (object of learning and timing of learning) to question whether, and if so in what way, explicit attention is given to learning in MSP. We are interesting to unpack a (plausible) "learning paradox", because this allows us to systematically assess the complexity and different conceptualizations of learning in MSP. In order to investigate this, we apply our assessment framework—consisting of the seven dimensions mentioned above—to scientific literature on MSP of the last decade and a case study on the MSP process in the Netherlands. We selected the Netherlands, because it is one of the frontrunners in MSP and, unlike many other countries, has already gone through several MSP processes. Therefore, one might expect some degree of learning has taken place over the years.

The outline of the paper is as follows: "Learning theories and learning paradox" presents different conceptualizations of learning relevant to MSP, and explains our use of, and elaboration on, the dimensions as set out by Armitage et al. (2008). "Material and methods" describes the methods used in our analysis consisting of a review of academic literature, and a case study focusing on MSP in the Netherlands. "A learning paradox in MSP literature?" gives an overview of the results of our literature review, and "A learning paradox in MSP policy process in the Netherlands?" presents our analysis of the ways in which learning in MSP has been made explicit in the Dutch case study. In "Discussion", we discuss our findings, and "Conclusion" concludes.

Learning theories and learning paradox

The term "learning" is a buzzword both in day-to-day life and in many policy fields. The Oxford dictionary defines "learning" as "the acquisition of knowledge or skills through study, experience, or being taught" (Oxford dictionary, https://en.oxforddictionaries.com/definition/learning). However, according to (Keen and Mahanty 2006), learning is fundamentally about "change" and more specifically the "act or process by which behavioural change, knowledge, skills and attitudes are required" (Keen and Mahanty 2006: p. 498, Knowles et al. 1998). A wide variety of terms and concepts exists with regard to learning (for example, see Bennett and Howlett 1992, Kolb 1984, Mezirow 1996, Sabatier 1988), but an important distinction is between individual learning and group/organizational learning (i.e. who learns). According to Fazey et al. (2005), both individual and organizational learning is necessary as individuals learn but organizations provide the social conditions affecting individual learning (Fazey et al. 2005). Also, in the realm of policy-making, individual learning has to go beyond the individual, to result in changing behaviour, knowledge, skills, and attitude.

Learning theories

To position learning within MSP, we identified three relevant, though interrelated, learning theories: policy learning, organizational learning, and social learning. Additionally, we looked into theories about the depth and quality of learning. We realize there are more learning theories, yet it is beyond the scope of this paper to give a full account of the state of the art.

Within the body of literature on policy learning, Bennett and Howlett (1992) argued that there are different conceptualizations of learning, e.g. "political learning" (Heclo 1974), "policy-oriented learning" (Sabatier 1987, 1988), "lesson-

drawing" (Rose 1991), "social learning" (Hall 1988), and "government learning" (Etheredge 1981). Bennett and Howlett (1992) tried to reconcile these five approaches by accepting that "(a) learning is in fact a complex, multi-tiered phenomenon which can affect either decision making organizations and processes; specific programs and instruments used to implement policy; and/or the ends to which policy is developed, and (b) that the agent of each type of learning will be different" (Bennett and Howlett 1992: p. 289). According to Kemp and Weehuizen (2005), policy learning refers to a "change in thinking", and more particularly a structured, conscious change in thinking about a specific policy issue (Kemp and Weehuizen 2005), such as MSP.

Learning in policy can also been seen as a form of collective learning, as policies are designed and implemented by a range of organizations (Kemp and Weehuizen 2005). This also applies to MSP where responsibilities are often divided among several departments/organizations. Views on organizational learning add complexity in terms of who learns what and why, as there is interaction at different levels (Kemp and Weehuizen 2005). This also relates to the theory of policy transfer: "a process in which knowledge about policies, administrative arrangements, institutions etc. in one time and/or place is used in the development of policies, administrative arrangements and institutions in another time and/or place" (Evans and Davies 1999: p. 361). Nauwelaers and Wintjes (2008) make a distinction between intra-organizational learning, intra-system learning, and inter-system learning as learning can take place inside organizations, between organizations in the same system, or with organizations in other systems (Nauwelaers and Wintjes 2008). Intra-organizational learning refers to a learning process where an organization or unit learns from past mistakes and successes. This often relates to "learning by doing". However, not every organization is equally well equipped to adapt or learn (see Senge 1990). Intra-system learning refers to a learning process where exchanges take place between several organizations that are part of a system, while inter-system learning refers to a learning process that involves comparison and benchmarking between own system and other systems (Nauwelaers and Wintjes 2008), for example learning from terrestrial planning.

Notions on social learning evolved into a separate strand of literature, particularly related to natural resource management (Pahl-Wostl 2009). Armitage et al. 2008 defined social learning as a process of iterative reflections when sharing experiences and ideas with others (Armitage et al. 2008). These others may refer to planners, stakeholders, and scientists in the context of MSP. According to Pahl-Wostl, social learning "revolves around processes of multi-party interactions, embedded in a specific societal and environmental structural context and leading to specific outcomes" (Pahl-Wostl 2009: p. 358). To them, learning also have different levels of intensity and scope (Pahl-Wostl 2009), which relate to another important aspect of learning, namely the depth and quality of learning. Argyris and Schon (1978) introduced the concepts of single- and double-loop learning, supplemented with the concept of triple-loop learning (Swieringa and Wierdsma 1992; Flood and Romm 1996; Tosey et al. 2012). Single-loop learning is focused on correcting errors by changing routine behaviour, while second-loop learning is about reframing the underlying assumptions of decisions and by that changing the rules for decision-making (Argyris and Schon 1978). Triple-loop learning is operating at a higher level and focuses on the ability to improve the organizations' capacity in single- and double-loop learning (Armitage et al. 2008).

The "learning" paradox

As the theory shows, there is a wide variety of different learning theories; some theories are fluid, overlap, or are interrelated. Learning is also an important area for research in environment and resource management, and this increased attention for learning has resulted in a paradox. While most scholars recognize the importance of learning, a critical appraisal of "basic" social science questions of who, what, and why, and also how and when is often lacking (Armitage et al. 2008). This is coined a "learning paradox" (ibid.). Considering a learning paradox in adaptive co-management of natural resources, Armitage et al. (2008) draw on Folke et al. (2005) to argue that "Greater specificity with respect to learning goals, approaches and outcomes is needed as individuals (e.g., resource harvesters, decision makers, scientists) and groups (resource management organizations, non-governmental groups, government departments) seek to collaboratively understand and manage environmental change, and identify specific strategies to deal with uncertainty and surprise" (Armitage et al. 2008: p. 87). Armitage et al. (2008) constructed five dimensions to unpack learning in the context of adaptive co-management: "1) types and definitions of learning; 2) learning goals and expectations; 3) mechanisms by which learning takes place; 4) questions regarding who is involved in the process of learning and 5) the risks and ethical ambiguities faced by different actors expected to willingly participate in a learning process whether formal or informal" (Armitage et al. 2008).

In this study, we build on the dimensions of Armitage et al. (ibid) to unpack a (plausible) "learning paradox" in MSP. MSP can be characterized as a politically guided and stakeholder-driven process, meaning that a wide range of actors (i.e. planners, stakeholders, scientists, public) are (should be) involved in the MSP process. Also, various learning mechanisms are used within the MSP process, from systematic studies to meetings and workshop to more innovative ICT tools. In addition to the five dimensions of Armitage et al., we add two more dimensions. Firstly, learning is about not only why you want to learn but also what you want to learn (i.e. object of learning). The development and implementation of

maritime spatial plans requires interdisciplinary knowledge and expertise, both from natural and from social sciences. Secondly, we include the dimension "timing of learning" since MSP is an iterative process that follows different policy phases (i.e. policy preparation, decision-making, implementation, monitoring and evaluation). While the scientific literature seems to emphasize the policy evaluation process, "learning" can take place at different phases in the policy-making process as well. For instance, in the policy preparation and development phase learning can take place as a result of stakeholder involvement or by carrying out specific studies. This often relates to instrumental, experiential, and social learning. In the remainder of this paper, the following seven dimensions will be used to explore the learning paradox in MSP: (1) definition of learning; (2) learning objective (goals and expectations); (3) object of learning; (4) timing in learning; (5) learning mechanism; (6) learning subjects; and (7) risks and ethical ambiguities.

Material and methods

In our study of a seemingly learning paradox in MSP, we focus on whether and if so, in what way the academic community and policy-makers have explicit attention to why learning is important in MSP. Overall, our geographical focus is on MSP in Europe, since this has been well studied from the onset of MSP in 2006. Moreover, the EU MSP Directive has entered into force in 2014 which indicates that MSP is seen as a relevant approach for policy- and decision-making. Our analysis is based on an extensive literature review and a case study.

Literature review

The literature review was conducted in a systematic way, following the steps of (1) defining our research questions; (2) developing a search strategy; (3) analyzing the selected studies by using the seven dimensions as explained above; and (4) reporting the results. In our search strategy, we used the keywords "Marine Spatial Planning" and "Maritime Spatial Planning" in combination with the keyword "Learning". Although other terms, like knowledge exchange, monitoring, and evaluation, would also give us relevant hits, the aim of the review has not been to be exhaustive but to analyze a considerable and relevant part of the literature. Furthermore, learning is a commonly used term and authors who want to address learning explicitly will use this term in one way or another conducted. Searches were conducted in the Scopus database. We limited our search to journal articles and book chapters published between January 2008 and September 2018. The year 2008 was chosen because in 2008, several keystone papers on MSP were published (for example in the special issue in Marine Policy, guest edited by Douvere and Ehler; Douvere and Ehler 2008). A total of 245 publications were retrieved through the Scopus database search, of which 68[1] remained after application of the inclusion and exclusion criteria as presented in Table 1. In our analysis, as shown in "A learning paradox in MSP literature?", we assessed whether the publications show explicit attention (yes/no) for the seven dimensions, and if not, whether there is implicit attention or no attention at all. We summarized and analyzed our findings in a spreadsheet (Supplementary Material available on request).

Case study

The case study serves the understanding in which way the learning paradox occurs in MSP policy practice. We selected the Netherlands, being an EU member state and one of the frontrunners in MSP. Therefore, one might assume or expect that some degree of learning has taken place over the years. Even though this does not automatically imply clear attention to what learning is, does, and for whom, it is likely that an explicit or implicit understanding of learning can be detected, at least to some extent.

The Netherlands has considerable experience in MSP for its part of the North Sea. Unlike many other countries, it has already gone through several MSP processes. The Netherlands is currently in its third official plan revision though there have also been partial revisions. In our desk study, we examined key policy and management plans, and additionally three external advisory reports commissioned by the Dutch government, which are relevant to MSP (see Table 2). Because it is beyond the scope of this paper to describe all documents in detail, we here refer to the recent publication by De Vrees (2019) on the adaptive MSP process in the Netherlands. Table 2 provides also a short description of the studied documents.

Similar to the literature review, we looked into the seven dimensions, as discussed in "Learning theories and learning paradox", to analyze if, and in what way, a learning paradox applies to the Dutch MSP policy process. This analysis is presented in "A learning paradox in MSP policy process in the Netherlands?".

[1] Of the 245 results, 42 publications and/or book chapters were duplications, 11 publications and/or book chapters were not retrieved, and another 124 publications and/or book chapters were excluded because they did not fulfil the inclusion criteria. The majority of these publications and/or book chapters lacked the term learning or marine/maritime spatial planning in the main text.

Table 1 Inclusion and exclusion criteria in literature review

Inclusion criteria	• Publications and book chapters that include the terms "marine/maritime spatial planning" and "learning" in the main text
	• Publications and book chapters that have been published in the period 2008–2018
Exclusion criteria	• Publication and book chapters that focus on marine/maritime spatial planning in a non-European context
	• Publications and book chapters were either "marine/maritime spatial planning" or "learning" is only mentioned in the reference list
	• Publications and book chapters that are not written in English
	• Publications and book chapters that are only available as abstract

A learning paradox in MSP literature?

Our review indicates that the academic community writing about MSP in Europe, and referring to the importance of learning, is facing a learning paradox. When assessing their explicit attention to learning, we found that only 2 of the 68 papers provide a definition of learning. Clarity about why, what, and when is also mostly lacking (explicitly mentioned in only 11, 25, and 10 papers respectively), as well as explicit acknowledgment of risks and ambiguities related to learning (15 papers). Authors are more open about who they think needs to learn in MSP processes and by what learning mechanisms: 35 respectively 49 papers stated this explicitly. Since none of the reviewed papers puts learning processes at the centre of their analysis, we cannot expect full focus on and clarity about learning. We therefore critically reviewed all papers for implicit references to learning based on the seven dimensions. This review provides more nuanced results (see Fig. 1), allowing us to analyze how scholars understand learning in MSP.

Definition of learning

Definitions provided in the reviewed literature, whether explicitly or implicitly, are related to various ways to frame learning. Many scholars write about learning as an experiential process, linked to adaptive management, emphasizing learning by doing. Mayer et al. (2014), being one of the two defining learning explicitly, refer to it as "adaptive changes of a system in response to internal incommensurability and/or external pressure" (Mayer et al. 2014: p. 393). Furlan et al. (2018), for example, state that public authorities, instead of creating new and expensive policy cycles, may use lessons learned to adjust existing ones (Furlan et al. 2018). In this sub-part of the reviewed literature, the keystone papers by Douvere and Ehler and their step-to-step approach are often mentioned, confirming the dominant discourse in MSP is that of adaptive management. Social learning is also applied as leading framework, e.g. Soma et al. (2015) point out, though not explicitly, that learning stems from deliberation, which is defined as communicative interaction based on reasoning and reflection (Soma et al. 2015). For Kelly et al. (2018), learning is associated with transition theory. Although they do not define learning explicitly, it is clear how learning is conceptualized. It is linked to niches where social and technical learning take place, and as part of participatory process that fosters transitions with specific emphasis on learning by doing and doing by learning (Kelly et al. 2018). A substantial part of the literature does not treat learning frames as exclusive but shows a mix, such as Österblom et al. (2017) who link learning clearly to adaptive management and also discuss social, institutional, and collaborative learning (Österblom et al. 2017).

Learning objective

Although few authors have been specific about the reasons why learning is important, we could construe that all mention learning objectives. We broadly identified three objectives, of which more than one could be addressed in a publication: learning for instrumental purposes, learning to better understand processes or change in processes, and theoretical learning. Publications highlighting instrumental goals show the importance of data and information in decision-making, mostly related to machine learning and modelling. Many publications emphasize the aim of better understanding processes. For example, Maguire et al. (2011) focus on stakeholder involvement because stakeholders are key in successful development and subsequent implementation of MSP (Maguire et al. 2011); Soma et al. (2015) claim that, theoretically, learning helps to get a common understanding of environmental conflicts (Soma et al. 2015); and, while referring to transition theory, Kelly et al. (2018) state that learning in niches allow for "altering existing regimes and catalysing broader institutional change" (Kelly et al. 2018: p. 28). The latter two papers also illustrate the sub-part of the reviewed literature which combines process understanding with theoretical work. Other papers serve however merely a conceptual or theoretical purpose; e.g. Gazzola et al. (2015) explore ontological differences between terrestrial and marine spatial planning (Gazzola et al. 2015).

Table 2 Brief history of maritime spatial planning in the Netherlands—overview of MSP management and policy documents, including external advices

1609	Hugo de Groot publishes Mare Liberum	
2000	Sectoral licencing	Until 2000, the Dutch maritime policy was based upon sectoral licencing on a first-come, first-serve basis.
2005	National Spatial Planning Policy Document	The primary objective was to enhance the economic importance of the North Sea and to maintain and develop the international ecological and landscape features by developing and harmonizing sustainable spatial-economic activities in the North Sea.
2005	Integrated Management Plan for the North Sea 2015	This plan sets out how the Dutch part of the North Sea will be managed for the coming 10 years and was focused around 3 themes: a healthy, safe, and profitable sea.
2005	Raad voor Verkeer en Waterstaat: Investeren in de Noordzee (In English: Council for Transport and Water Management: Invest in the North Sea)	The council advocates a proactive approach to the North Sea on the part of the central government and that the government should invest in a long-term approach to the North Sea. They also recommend the appointment of a North Sea minister and the creation of an investment fund for the North Sea.
2009	National Water Plan that contains North Sea Policy including Marine Spatial Plan 2009–2015	This is the first "formal" MSP. The government has opted for a sustainable, space-efficient and safe use of the North Sea in balance with the marine ecosystem. The government gave priority to activities of national importance for the Netherlands. These included sand extraction and replenishment, sustainable (wind) energy, oil and gas extraction, CO_2 storage, sea shipping, and military areas at sea.
2011	The Integrated Management Plan 2015 (revised)	Revision of the plan of 2005 accordingly to the changed policy.
2011	Raad voor de Leefomgeving en Infrastructuur (RLI): Een zee van mogelijkheden (In English: Council for the Environment and Infrastructure (CEI): A sea of possibilities)	The Council is of the opinion that the central government should actively focus on making optimal and sustainable use of the sea and creating room for new initiatives. They recommend that a "North Sea Development Plan" be drawn up for the Dutch part of the North Sea.
2014	North Sea 2050 Spatial Agenda	A long-term vision for the North Sea in 2050. A report of joint research into the long-term potential of sea and coastal areas, translated into a vision, series of ambitions, opportunities, points of action, and maps.
2014	Partial revision National Water Plan that contains North Sea Policy including Marine Spatial Plan 2009–2015	Designation of additional offshore wind energy areas: *Hollandse Kust* and *Ten Noorden van de Waddeneilanden*.
2015	Second National Water Plan that contains the North Sea Policy 2016–2021	This is the second "formal" MSP. Main changes due to renewable energy plans, sand mining strategy, and MSFD measures. The 6 priority functions were the same as in 2009.
2016	Partial revision Second National Water Plan that contains the North Sea Policy 2016–2021	Designation of additional offshore wind areas between 10 and 12 nautical mile of the Dutch coast.
2018	Offshore Wind Energy Roadmap 2030	In the Offshore Wind Energy Roadmap 2030, the Cabinet outlines the plans and designates locations where new wind farms may be built between 2024 and 2030.
2019	North Sea Strategy 2030 (ongoing)	A broadly supported participation process resulting in an agenda that will contain the strategic challenges—including timing, areas of tension, and opportunities—with the related key options for national and (international) investment, knowledge, and cooperation agendas.
2019	Overlegorgaan Fysieke Leefomgeving (OFL) Noordzeeoverleg (In English: Consultative Body Physical Environment North Sea consultations) (ongoing)	OFL has been asked to set up and put into operation a North Sea consultation with the national government and stakeholders. The aim is to reach a "North Sea Agreement" with the relevant ministries and social partners.

Source: Adapted from de Vrees (2019)

Object of learning

If we consider both explicit and implicit references to what needs to be learnt, we found that all publications address their object of learning. This is of course not surprising since scholars publish their research to convey lessons to others, and often need to provide keywords and/or highlights which makes it easy to determine the topic of research. We however considered these to be implicit references, and identified that the object of learning is overtly clear in circa one-third of the reviewed literature.

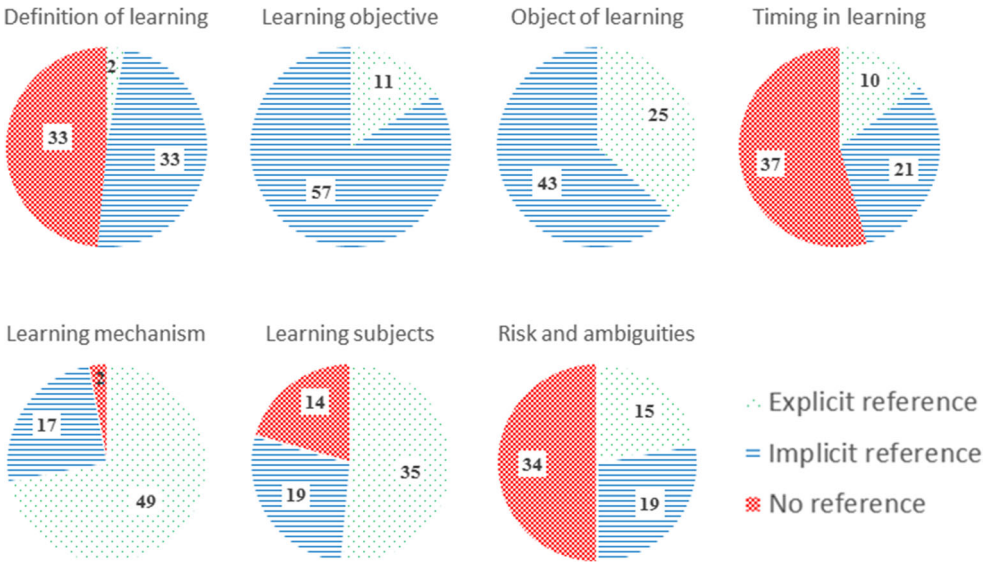

Fig. 1 Results of literature review

Timing of learning

Few authors explicitly address "when" learning takes place or should take place. For some, especially when related to stakeholder engagement, learning is situated early in the process, like Ritchie and Ellis (2010) suggesting that a community of practice has to be developed early in the MSP process (Ritchie and Ellis 2010); for others, learning is much related to the phase of monitoring and evaluation. However, most authors refer (implicitly) to learning as a continuous process, e.g. Flannery et al. (2010) stating that "collaborative planning process is seen as a learning and iterative process" (Flannery et al. 2010: p. 61).

Learning mechanism

The majority of the reviewed literature refer to the ways by which learning can be facilitated and fostered, the biggest part even states the "how" explicitly, and a wide variety of tools and methods are mentioned. For example, Mayer et al. (2013, 2014) and Keijser et al. (2018) focus on the use of serious games, more explicitly the Maritime Spatial Planning Challenge, as a tool for policy-oriented learning. They indicate how simulation gaming (SG) can help participants exploring the complexity of MSP (Mayer et al. 2013) and let them "thinking and talking" about the interrelations among different marine uses and objectives (Keijser et al. 2018). Next to tools, methods like workshops are mentioned to be useful to facilitate learning, yet often implicitly or in a side note. Some papers focus on engagement approaches like (pilot) projects such as Fletcher et al. (2013) who evaluated two pilot studies in Southern England, designed to "explore how marine planning might be conducted in England, which will inform both the future roll-out of marine planning in England and may point to wider conclusions about marine planning practice elsewhere" (Fletcher et al. 2013: p. 342).

Learning subjects

The reviewed literature shows clarification of who needs to learn in MSP. Most point to actor groups, like scientists, planners, and fishers, or refer to stakeholders in general. Though addressed as part of a particular group, for most authors, learning subjects are individuals. In some papers, authors address (also) organizational and institutional learning, like planning authorities or NGOs. Rehhausen et al. (2018) for example, when referring to double-loop learning, state "Much depends on how values and actions of plan-making institutions change" (Rehhausen et al. 2018: p. 54).

Risk and ethical ambiguities

Ethics and ambiguities related to learning are sometimes addressed explicitly, such as by Anbleyth-Evans (2018) investigating integrating local fisheries ecological knowledge with scientific research, and claiming that the current knowledge hierarchy prioritizes scientific knowledge over local ecological knowledge (LEK) (Anbleyth-Evans 2018). Jentoft (2017) discusses MSP as "good governance". He mentions that "MSP as a governance mechanism is not only about 'distributive justice' but also about 'process justice' or 'procedural justice', in other words, whether or not legitimate stakeholders

have real influence in MSP" (Jentoft 2017: p. 267). Other articles, especially those on stakeholder involvement, mention the inequality and difficulty of some sectors to be included in the MSP process, which is (often implicitly) linked to ambiguity, as not being involved in the MSP process means that learning within that same MSP process cannot take place. An identified risk is for example the lack of capacity building. Röckmann et al. (2015) explicitly mention the importance of sufficient resources, "such as manpower, time, money, space, interaction fora/channels, language capacities" (Röckmann et al. 2015: p. 159). Andersson et al. (2017) also emphasize differences in resource mobilization, so limited access to capabilities, resources, and knowledge from industries in the energy, manufacturing, and offshore sectors (Andersson et al. 2017).

A learning paradox in MSP policy process in the Netherlands?

Based upon the examination of various documents related to the Dutch MSP process, we find that the learning paradox also applies to the MSP policy process in the Netherlands as in general little explicit attention is given to learning in the MSP process. In this section, we discuss the question in what way the seven dimensions, as described in "Learning theories and learning paradox", also apply to the Dutch MSP process. We do this by giving several examples from the MSP process in the Netherlands, in which offshore wind energy ambitions have been a major driver (Jay, 2010b; de Vrees 2019). Moreover, sand extraction (related to the need for strong coastal defence against sea level rise) and commitments to achieve a Good Environmental Status (GES) of the marine environment are key issues in Dutch MSP. In this section, we focus on offshore wind energy because this topic is very timely and it illustrated different forms of learning in Dutch MSP very well.

Definition of learning

The term "learning" is rarely mentioned in the various policy documents on MSP. In the current MSP plan (e.g. Policy Document on the North Sea 2016–2021), the word "learning" occurs only once and is not defined. In the external advices, learning is mentioned in the context of "learning by doing" (RVW 2005; RLI 2011).

Learning Objective

Learning objectives are not explicitly mentioned in the MSP documents, but they are implicitly part of the policy objectives. These objectives are comparable with the learning objectives identified in the literature review (e.g. instrumental learning and process learning).

For example, the central governments' objective with regard to sustainable energy is that 14% of all energy used in the Netherlands to come from sustainable sources by 2020 and 16% by 2023. Offshore wind energy is an important source for realizing this objective. For the Dutch part of the North Sea, a concrete target of 4450 MW of offshore wind energy by 2023 was agreed upon (SER 2013). In order to achieve this objective, various research questions have been formulated, such as where can offshore wind energy be realized at the lowest cost? What are the effects of offshore wind energy on the ecology (i.e. effects on marine mammals, birds, and bats) and other uses? These questions have been examined in various studies with involvement of different actors. With regard to the last question, the Framework for Assessing Ecological and Cumulative effects (KEC) has been developed, which focuses less on the effect of individual wind farms and more on the ecological impact of all the wind farms as a whole (Rijkswaterstaat 2019).

Over the years, marine policies have also considerably changed, mainly as a result of the increase in offshore wind energy ambitions. As set out in the National Spatial Policy Document in 2005, the government has opted for a spatial policy in which usage zones were defined wherever necessary, but which gave market parties leeway to develop initiatives within certain constraints (Min. ESP 2005). This policy worked well until the ambitions for offshore wind energy took off. When the Ministry of Economic Affairs announced that there would be a subsidy available for developing an offshore wind farm, 76 initiatives were proposed, while there was only subsidy available for three wind farms (de Vrees 2019). As a result, various stakeholders called for a spatial plan to provide more certainty to developers and other sectors. This resulted in the first "formal" MSP as part of the National Water Plan (NWP) 2009–2015 in 2009 (see Table 1) where the government designated specific areas for offshore wind energy (Min. TPWWM et al. 2009). Hence, there has been a shift from a reactive approach based on licencing to a proactive approach in which the government itself designates areas where offshore wind energy can take place (see also Table 3).

Object of learning

In the last decade, dozens of studies have been carried out on numerous topics related to the North Sea as input for the Dutch maritime policy. Some studies relate to a specific sector or theme (e.g. offshore wind energy, shipping, sand extraction), others relate to a specific Marine Strategy Framework Directive (MSFD) descriptor or measure (e.g. marine litter, seabed protection, underwater noise), and yet others are more generic, for example, studies on multi-use of space, the economic importance of the North Sea, and future scenarios for

Table 3 Overview of offshore wind energy policy in the Netherlands

The rollout of offshore wind energy in the Netherlands can be divided in 3 rounds	
Round 1	The existing wind farms, Princess Amalia Wind Farm and the Egmond aan Zee Offshore Wind Farm, are part of round 1.
Round 2	In round 2, private parties could choose a location in the North Sea to apply for a permit. The construction of wind farms was permitted everywhere, except in the 12-mile zone, in shipping routes and a few other areas. In total, 12 permits were granted in 2009, of which 3 of them were subsidized.
Round 3	In round 3, the government designate specific areas for offshore wind energy and no new wind farms are permitted outside these areas. Within the designated areas, the government takes so called wind farm site decisions. Each wind farm site decision specifies where a wind farm may be built in the area and under which conditions. These conditions leave space for the builders to decide—within specific frameworks—which technique to use. The developer that can build the best and least expensive wind farm will be simultaneously granted the subsidy and the permit to build the wind farm.

Based upon Min. I&E and Min. EA 2014a

the Dutch part of the North Sea (see Noordzeeloket, www.noordzeeloket.nl/en/publications/). An observation made by Kraan et al. (2019) is that in practice research focuses mainly on the ecological part of the system and that social dimensions are given less attention (Kraan et al. 2019).

In general, the Dutch government is more explicit in what it wants to learn compared with the literature review. Although learning is not explicitly mentioned in the MSP policy documents, the learning objects for the underlying studies are in generally explicitly stated. This is of course necessary as scientists or consultants have to know what is the object of study. In addition, stakeholders and experts are also often involved in these studies or they are invited to specific workshops, and it should also be clear to them what the purpose of the study or meeting is.

Learning mechanisms

Various learning mechanisms have been used in the Dutch MSP process and related policy processes. Many of these tools correspond to the ones we identified in the literature review. In addition, external advice is a source of information and gathering new insights. For example, the Council for the Environment and Infrastructure recommended that a "North Sea Development Plan" be drawn up for the Dutch part of the North Sea. In the Councils' view, a more active involvement would create a broadly supported perspective on the development of the North Sea (RLI 2011). Their advisory report "A Sea of Opportunities" has been largely adopted by the government and has resulted in the North Sea 2050 Spatial Agenda process (Min. I&E and Min. EA 2014b).

In the Dutch context, meetings and workshops are important. These are moments when participants exchange information and knowledge. In these exchanges, also innovative learning methods are used. For instance, during the meetings of the North Sea 2050 Spatial Agenda, stakeholders have shared their interests, future visions, knowledge, insight, and wishes regarding the state, layout, use, and management of the North Sea in the future, using beach walks, presentations, video material, and serious gaming as ways to foster dialogue (Min. I&E and Min. EA 2014a, b). The MSP Challenge serious games, also mentioned in the literature, is interesting to highlight. The Ministry of Infrastructure and Water Management kick-started the development of the MSP Challenge in 2011 (also described/referred to in the reviewed literature, e.g. Mayer et al. 2013, 2014; Keijser et al. 2018). Since then, three types of serious games have been developed: a role-playing game, a simulation game, and a board game. The different MSP Challenge serious games have been used in workshops, conferences, and educational programmes as well as for stakeholder engagement nationally and also internationally (Abspoel et al. 2019).

Learning can also take place via experimentation and pilots. There is room for experimentation in the Dutch MSP policy, because the government can designate an area for experiments aimed at supporting the sustainable development of the North Sea in the longer term (Min. I&E and Min. EA 2015). In 2018, the Community of Practice Blue Innovation has been launched. Within this Community of Practice, various parties share knowledge with each other on issues as regulations and technical feasibility regarding multi-use of the North Sea. Knowledge and experiences are gained via pilot projects in the North Sea (RVO n.d.).

Timing in learning

Although the Policy Document on the North Sea 2016–2021 contains a generic action plan with actions, such as studies, to be carried out by topic, including responsible ministry and year of implementation, the timing of learning is not explicitly addressed in the policy documents. The Dutch MSP process generally follows a pattern of policy preparation, policy development, decision-making, policy implementation, and monitoring and evaluation. The process from policy

preparation to a maritime spatial plan takes approximately 2 years. During the policy preparation and development phase, many meetings take place and new studies are conducted, often resulting in new insights and knowledge, which will be used as input for the MSP.

The Dutch Water Act prescripts policy renewal every 6 years, so revised MSP has to be developed which is adapted to new societal demands and new knowledge and experiences acquired (de Vrees 2019). This corresponds to the government's policy of pursuing a development-based approach to the sea that leaves room for new initiatives and flexible management of the sea (Min. I&E and Min. EA 2015). Monitoring and evaluation plays an important role in this respect and is also frequently mentioned in the MSP policy documents. In other words, the MSP process in the Netherlands is based upon adaptive management, in which "learning", although not explicitly addressed, plays a continuous role in the process.

Subjects in learning

Different actors are involved in the MSP process in the Netherlands, such as policy officials, stakeholder representatives, scientists, and the general public. The policy officials work for various organizations and ministerial departments. The Ministry of Infrastructure and Water Management[2] is responsible for coordinating the integrated North Sea policy and management. In addition, various ministries have sectoral responsibilities. For example, the current Ministry of Economic Affairs and Climate is responsible for the energy policy, and the Ministry of Agriculture, Nature and Food Quality is responsible for nature and fisheries policy.

The involvement of the various ministries and organizations shows that the maritime policy in the Netherlands is compartmentalized and fragmented, while, over the years, there have been changes in the responsibilities of the various ministries as a result of political changes. A small core group of policy officials involved in MSP have remained the same over the years and have acquired a great deal of knowledge and experience, both in terms of content and in terms of process. Whether learnt knowledge and learning experiences are explicitly recorded and shared or remained mainly personal, is hard to assess; however, the OFL advisory report stated that: "Stakeholders note that ministries rarely share the knowledge they have at their disposal on their own, which means that they are not established as a 'jointly found fact'." (OFL 2018).

Stakeholders are involved at various stages of the MSP process, formally and informally. Formal consultation takes place via the Consultative Body Physical Environment (in Dutch Overlegorgaan Fysieke Leefomgeving), which is made up of representatives of civil society organizations and sectors that use the North Sea. Stakeholders are also regularly invited to specific meetings and workshops. For example, the realization of the assessment framework for safety distances between shipping lanes and offshore wind farms was drawn up by working group "safety distances" consisting of the Ministry of Infrastructure and the Environment, Rijkswaterstaat, and the ports of Rotterdam and Amsterdam (Min. I&E and Min EA 2014b), while the assessment framework for safe distances around oil and gas platforms has been realized in coordination with the mining sector (Min. I&E and Min. EA 2015).

At the time of writing, also various meetings take place within the OFL process, the so-called Noordzeeoverleg (In English: North Sea consultation) where a wide range of stakeholders (i.e. NGOs, sector representatives, and ministries) exchange information and knowledge with each other (OFL n.d.).

Risks and ethical ambiguities

Ambiguities and ethical inequalities are not explicitly discussed in the various MSP plans, but implicitly relate to stakeholder involvement. Generally, Dutch policy processes are characterized by participation and deliberation, and as mentioned before, there is indeed frequent dialogue with different stakeholders, at different levels and at various stages of the MSP process. Because stakeholders are invited to participate, (policy) officials determine who is and who is not involved in the MSP process, and who does and does not have the opportunity to learn. Although there may be good reasons why certain stakeholders are invited and others not, such reasons and decisions are not made public.

Over the years, and also more recently with the current North Sea Strategy 2030 process, many stakeholder sessions have been organized. The time and capacity of the various stakeholders play a role in whether specific stakeholders can actively participate in the MSP process. In general, policymakers and other professionals (i.e. offshore sector) have often more time and/or resources at their disposal than other stakeholders, such as fishers or citizens. Kraan et al. (2019) note that if this is not taken into account, there is a risk that people will sit at the table, but will not be able to make a real contribution (Kraan et al. 2019).

Discussion

Both the scientific European MSP literature review and the case study about the MSP process in the Netherlands show that there is a learning paradox in the field of MSP. Our

[2] The current Ministry of Infrastructure and Water Management (2017 until present) has changed its name a number of times in the past due to political changes. From 1946 to 2010, it was called the Ministry of Transport, Public Works and Water Management, and from 2010 to 2017, it was called the Ministry of Infrastructure and the Environment.

analysis shows that the seven dimensions which we indicated to reveal the paradox, are not fully or openly referred to. Also, the extent to which learning is made explicit, differs for the dimensions. Furthermore, we found not all seven dimensions are considered equally important between policy-makers and scientists.

Commonalities in the literature review and the case study are that learning is not explicitly defined. Looking into more detail, learning in the Dutch MSP process is implicitly part of the policy objectives and corresponds mainly to instrumental learning and process learning, while in the literature review, learning remains only implicit but with more divergent underlying views—which is no surprise, since academics have more interest in theoretical learning. A substantial part of the literature does not treat learning frames as exclusive but shows a mix; while some publications link learning to adaptive management or transition theory, other publications discuss social, institutional, and collaborative learning. The case study also clearly shows examples of both organizational and social learning.

There are also similarities in reference to different learning mechanisms, such as who to involve in the MSP process, and topics such as offshore (wind) energy, ecological issues, governance, and stakeholder involvement. Although sand extraction is important in the Dutch MSP process, it is rarely mentioned in the reviewed academic studies. While there is little attention to risk and inequalities in both the literature review and the case study, we did not foresee this lack to be so large in the reviewed literature, as academia is expected to contribute by critical engagement. Also, the little (explicit) attention for timing of learning in the Dutch MSP process is remarkable. This could be explained by the fact that civil servants and politicians, when dealing with new issues in MSP processes under time pressure, make use of tacit knowledge. Tacit knowledge is based "on the individual's actions, commitment and involvement and is difficult to express in words" (Stange et al. 2015).

Making learning an explicit part of the MSP process has at least three important advantages. Firstly, when learning becomes an explicit part of the MSP process, it becomes clear what we want to learn and why. This will emphasize intended learning outcomes, which helps to understand and improve the effectiveness of learning processes. Secondly, explicit attention to the learning paradox puts the power question on the table: who is (has been/should be) involved and who is (has been/should be) excluded from learning processes? And finally, the advantage of making learning more explicit is that it becomes more clear how we can learn from each other, both in terms of content and in terms of process. In order to convey learning experiences, it must be clear how this learning came about (i.e. what was learned, with whom, when and how). Hence, the recording of learning experiences, both process and content, is also very important because MSP is not a one-time exercise.

Conclusion

The main conclusion of this paper is that the minor explicit attention to learning reveals the existence of a learning paradox in MSP, based on a review of academic literature and the Dutch case. We found that this paradox is paramount to improve the effectiveness of learning processes in maritime spatial planning processes. The literature review and case study show both similarities and differences in the extent to which the learning paradox applies. However, the existence of the learning paradox does not mean that there is no learning. Both the literature review and the case study show clear examples of learning. Our qualitative assessment of policy documents for the Dutch MSP case showed that over the years, learning has taken place, both in terms of content and in terms of process. The same holds for our gained insights from the literature review, where we identified new lessons taken up, and the generation of new knowledge to the benefit of MSP processes.

In this paper, we stressed the importance of learning processes in MSP, especially the ways and the extent of learning, ultimately questioning whether unpacking the learning paradox leads to more and better learning. One could argue that leaving the learning paradox as it is has benefits, particularly in policy practices where the importance of learning is self-evident. It may take (too) much time and energy to make tacit learning processes more explicit. In addition, taking learning for granted provides some common ground in the policy field of MSP, in which governing user-user and environment-user interactions is already a major balancing act. However, at the same time, we argue that it is crucial to make learning processes more explicit to improve MSP processes, to get insight in power processes of inclusion and exclusion, and to learn from different actors involved. When learning is made more explicit, it is important to realize that "all learning processes are contextual – that is they exist in relation to the place in which they occur, the experiences from which they arise, and the cultures with which they are associated" (Keen and Mahanty 2006: p. 498). In recognizing contextuality, we however need to not only look into the three questions posed by Bennett and Howlett 1992 (e.g. who, what, and to what effect), but also consider for example risks and ethical ambiguities of learning which we found is underdeveloped for MSP. By giving explicit attention to all seven dimensions, we can truly and fully capture learning processes and assess how learning contributes to MSP.

Compliance with ethical standards

Conflict of interest This research is part of the PhD thesis by the first author on the use of Serious Gaming in Maritime Spatial Planning at

Wageningen University, the Netherlands, with support of Rijkswaterstaat. The lead author describes his findings as a researcher on a personal title and does not do so on behalf of Rijkswaterstaat or the Ministry of Infrastructure and Water Management.

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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